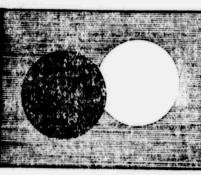
PROF. HOLDEN TELLS OF THE ASTRO-NOMICAL EVENT OF MAY 28.

A Rare and Impressive Celestial Phenomenor -It Will Be Total in Part of the South and Visible All Over the United States Scientific Interest Aroused What Is Known of Eclipses - Preparations to Observe It ome Suggestions to Amateur Observers.

It is proposed to bring together, in the following paragraphs, some account of the total adjar cellpse of May 28 next, and to give particulars that will be of interest to those persons who intend to see it, either at astronomical observers or as mere spectators. In the first place it should be said that every person who can spare the time and the money ought not to miss the opportunity of witnessing so glorious and impressive a spectacle. The last total eclipse visible in the United States was in 1878. there will not be another until 1918.

TOTAL SOLAR ECLIPSES. An eclipse of the sun is caused by the moon (the new moon) moving in her orbit between the earth and the sun. The sun's light is thus occulted eclipsed and the earth's atmos-

ophere becomes dark. So far, this is a phenomenon that happens every evening at sun-But the glory of a total solar eclipse is the corona which is visible at that time and at no other. The corona is a kind of an envelope ourrounding the sun, and extending for millions of miles away from it. Part of it is made up of the invisible gas, coronium, so-called, which extends all around the sun. The presence of this gas was first discovered by two American astronomers, Prof. Young of Prince-



BEGINNING OF A SOLAR ECLIPSE

ton, and Prof. Harkness of Washington, in 1896, by means of the spectroscope. The specona cannot be seen with the naked eye or with of the sun. The visible corona is produced by the reflection of smallfat from billions of small particles, which occupy the spaces on either side of the sun, and revolve around It, as night-flies cluster round an electric street lamp. At a total eclipse the direct light of the lamp (the sun) is shut off; but the swarm of particles is still illuminated, and it is visible. We do not see the corona every and any day at noon for the reason that it is a little less bright than the general illumination of our own atmosphere. It is usually projected on a background of about the same brilliancy as itself, and then, of course, is not separately

But when the moon shuts off the direct light of the sun the corona stands out against a darkened background and then, and then only, can be seen with the naked eve

PHENOMENA OF ECLIPSES.

The beginning of a total eclipse is marked by a small black notch in the bright circle of the sun caused by the advancing moon. The moon is black because its dark side is turned toward us (it is new moon). At a total eclipse the moon gradually cove's more and more of the sun's disk until only a thin crescentlike the sickle of the young moon-remains To the general spectator there is little to notice



unless it be the altered shapes of the images formed by the small holes or apertures, like the spaces between the leaves of a tree, for example. Under ordinary circumstances, the Image of the sun made by the solar rays that pass through a small hole-in a card, for example are circular in shape, like the shape of the sun itself. When the sun is crescent, the images or the sun formed by such holes are also crescent, and if the observer is under a large tree the appearance is quite striking. The experiment is worth trying at any rate and it serves to pass the time till the approach

As the light of the sun is diminished in quantity a change of its color is also remarked. This grows more and more pronounced and gives to the adjacent landscape that strange and weird effect which lends so much to the impressiveness of a total eclipse. The rays of the crescent sun which now light the landscape come from points near the sun's edge, and therefore pass through a greater thicksun's atmosphere, like our own, absorbs proportionally more of the blue rays. And theremore red, just at sunsets.

The shadow of the moon is projected down-

prodigious swiftness—at the rate of some thirty miles a minute. If the observer is on an emi-nence he can see it approaching his station. and in a moment it reaches him. Just at this instant the darkness suddenly increases, the brighter stars and planets begin to shine out In the sky and suddenly the moon, an intensely

An instant more and the corona is seen surrounding the black orb of the moon, shining with a pearly soft effulgence, quite different

from any light known to us. Near the moon's



sun-for about nine million miles.

THE SUN'S COMING ECLIPSE | telescope or a spectroscope much may be added to our scanty knowledge. The total phase endures (in 1900) a little over a minute and then, suddenly, the sunlight reappears and there is a repetition of the phenomena of the partial phase, in reverse order, however.

> The phenomena that have been briefly described have been seen by generations of men for countless ages. No doubt our remote ancestors were terrifled beyond words by these appearances, but as the world did not come to an end then and there, they invented a name for the appearance, wove legends about it, and by began to observe it carefully. The Chinese have statistics of eclipses going back more than four thousand years. The legend of their common people is that a dragon is endeavoring to devour the sun and they frighten him away by beating drums. It is quite possible that the Chinese flag- a blue dragon swallowing a red ball - has something to do with this early belief

> At the beginning of the century little attention was paid even by scientific men, to the

arranged their instruments so as to make the best possible use of the few precious seconds of the total phase. If the spectator wishes to be useful, and if his station is near a regular observing party, he cannot do better than to place himself under the orders of the astronomer in charge. If, on the other hand, there is no observing party near by, he can attend to certain matters that will be more or less neglected by the professionals. It is hardly worth while to make drawings of the corona, considering that admirable photographs will be taken by dozens of observers. A printed pamphlet of instructions to photographers issued by the United States Naval Observatory recommends as follows:

"Taking f-n 15 as a representative photographs instruction four classes of expos-

ssued by the United States Navai Observatory ecommends as follows:

"Taking f-a 15 as a representative phoorganic instrument, four classes of exposres are indicated for the most radii plates,
"First-For prominences, 1-60 to 1-45 of second. second. For the inner corona, 1-10 to 1-5

of a second.

Third—Carrying the exposure to \(^1_2\) for a second gives a great increase in tarea commanded, and one second may taken as marking almost the limit of a tea useful exposure for the corena as a whole.

"Fourth—To secure the long rays, exposure of the second second as a second second as a second Fourth—To secure the long rays, expos of 100 seconds or upward are necessary, si fleing the inner corona for this purpose. is possible that exposures of 200 or 300 second



occurrence were noted, but that was all At trum of coronium is characterized by a bright; the eclipse of 1836 Francis Baily noted that the line in the green. Of course, the gaseous cor- thin solar crescent broke up into little spots of light in a peculiar way, forming, for an instant, what are called "Baily's beads." At the telescope. A spectroscope is required stant, what are called "Baily's beads." At to prove the presence of the gaseous envelope the time there was no explanation forthcoming and astronomers began to realize that they knew little or nothing about the sun itself. not to speak of the corona. Red "flames" were seen close to the moon's edge (they are part of the sun's atmosphere of incandescent hydrogen) and it was disputed for a long time whether they belonged to the sun or the moon. It was not until Young's observation of the coronal spectrum in 1869 that the serious study of the solar surroundings began.

About thirty years, therefore, is the age of modern views of the sun and of the corona. Everything known has been learned by men now living, and it is a fact worth remarking. It ought to teach us a little humility which is useful in science as it is in other walks of life. The eclipses of 1851 and 1860 proved that the hydrogen flames belonged to the sun, and not to the moon. At the eclipse of 1868 a method was discovered of observing (with a spectroscope) these bright hydrogen "prominences" on any and every day. They are so much brighter than their background that the observation is not very difficult, and they are now regularly mapped at several observations. In 1869 the green hue of coronium, the coronal gas, was discovered. So far, this gas has not been discovered on the earth.

THE TOTAL SOLAR ECLIPSE OF MAY 28, 1900. The track of total eclipse extends across northern Mexico, traverses the United States from New Orleans to Norfolk, touches western Portugal and Algiers and ends at sunset near he Red Sea. A partial eclipse will be visible and of Europe, and over a part of South America and much of Africa; but it is the total phase

and of Europe, and over a part of South America and much of Africa; but it is the total phase that is of special importance to astronomers, and the total phase in the United States which a specially interesting to Americans.

The large map is copied from a pamphlet issued by the United States Naval Observatory at Washington, and is self-explanatory. The path of the total phase is marked by two lines running from New Orleans to Norfolk. An observer anywhere between those lines will see a total eclipse. Outside of them he will only see a partial obscuration.

The times marked on the map are Greenwich times, five hours fast of our New York railway standard time. At Norfolk the middle of totality occurs about 2 P. M. of Greenwich time, or about 9 A. M. of local time. The duration of totality is there one minute and fortynine seconds. At New Orleans the local time of totality is about seven hours and thirty minutes A. M. and the duration one minute sixteen seconds. The sun will be lower in the heavens at New Orleans than at Norfolk and the duration shorter. The stations likely to have the best weather are in the interior.

The circumstances of the eclipse for a station near Union Point, Ga., dialtitude 33 degrees 32 minutes west.) are for example:

Local Mean Time (Ast.).

Bezinning of celling.

Local Mean Time (Ast. Duration of eclipse First Contact. Fourth Contact.

Position-angle. 256* 32' 2 76* 33' 4

Position-angle. 256° 32′ 2 76° 33′ 4

The position angle is measured from the north point of the sun's image toward the east.

Winnsboro, S. C., lies almost directly in the central line of totality of eclipse and is a good station for spectators to choose. The town is situated on the main line of the Southern Railway about thirty miles from Columbia, the capital of the State. It has telegraph communication through the Western Union Telegraph Company, and also has long distance telephone connection with Washington, New York New Orleans and other large cities of the United States. The hotel accompositions are good and can be easily obtained for any number desired. The health of the town is excellent and the water good. What is of most importance is the atmospheric conditions. If the local weather record of past years can be taken as a criterion for the future this section has a reasonable assurance of bright, clear, cloudless weather for observations on the 28th of May next. The town is situated about six hundred and fifty feet above sea level, being, if not the highest, one of the highest points in South Carolina along the line of totality.

The United States Navai Observatory at Washington will equip two parties, one in

OBSERVING PARTIES.

The United States Navai Observatory at Washington will equip two parties, one in North Carolina, the other in Georgia, by means of an appropriation of \$5.000, and the Smithsonian Institution will carry out a similar programme for which an appropriation of \$4.000 is available. The colleges and universities of the country will be well represented. Expeditions will probably be despatched by Harvard, Yale, Columbia, Princeton, the University of Pennsylvania, the University of Virginia, the University of Chicago, &c.,

tory Eclipse Expedition, Atlanta, Ga. OBSERVATIONS TO BE MADE.

The mere spectacle is worth a long journey | Astronomers have prepared their pro-to see. If the appearances are studied with a grammes of observation long ago and have

phenomena of eclipses. The times of their or even longer may be found advantageous, or even longer may be found advantageous, but exposures from 2 seconds up to 50 or 60 or upward, require the most skilful manipulation in development to render them of any service otherwise detail in the corona proper is sacrificed without any sensible increase in the representation of the streamers. Triple-coated (non-balation) plates should be used for such long exposures, and the condition of the sky will have to be taken into consideration. If the atmospheric glare in the vicinity of the sun be great, or if it diminish more slowly than the corona as the distance from the sun increases, a limit will be reached beyond which the streamers cannot be photographed.

"The one and only caution to be borne in mind is that the camera should be firmly and rigidly mounted.

mind is that the camera should be firmly and rigidly mounted.

"The choice of instruments is not limited to cameras and photographic telescopes. Prof. Barnard's beautiful photograph of the corona of the 1889 California eclipse shows that a visual objective, with the aperture sufficiently reduced, may give excellent results. He used a 3½-inch Clark equatorial, 49 inches focal length, with the aperture reduced to 1½ inches. With an exposure of 4½ seconds on a moderately rapid plate, he obtained as large an extent of the corona and as great wealth of detail as Prof. Pickering with his 13-inch photographic telescope of 196 inches focal length, the latter using a slow plate.

"In focusing the instrument, it should be pointed at a well-defined object, distant, say, from a quarter mile to a mile, and the object brought to a sharp focus for the centre of the plate. The image of the eclipsed sun is really a small object, and occupies but a comparatively small part of the centre of the field. The focal length of the camera in inches will give roughly the diameter of the sun's image in hundredths of an inch. The image of the corona will be from two to four times these dimensions.

"To secure the best results, however, it would mounted.

dimensions.

"To secure the best results, however, it would be better to determine the stellar focus by photographing trails of stars, and selecting the adjustment which gives the sharpest definition (finest line) in the centre of the field. In this connection, it is important to notice that Prof. Barnard's success with the visual telescope, noted above, was made pressible by telescope, noted above, was made possible by the great care with which he thus determined the photographic focus of his instrument. aution must be rigidly observed

"One precaution must be rigidly observed—
the original negative must not be retouched
or altered, as it will destroy entirely its scientific value.

"The United States Naval Observatory will
publish an extensive report on the eclipse
results, and would be glad to include photographs which may possess sufficient scientific
merit. If the original negative is sent to the
Observatory, it will be returned after using
The data accompanying such negatives should
include a description of the apparatus, kind
of plate and developer, length of exposure,
and location of station. The plate should
also have been marked previous to exposure,
to indicate the top side of the plate.

TELESCOPIC OBSERVATIONS. TELESCOPIC OBSERVATIONS.

TELESCOPIC OBSERVATIONS.

"Telescopes—A proper telescope for observing the eclipse is very desirable, but any telescope at all is better than none; and owners of small spyglasses, or opera-glasses, should bear in mind that their instruments are capable of doing good service. Opera-glasses can be held in the hand with sufficient steadiness, but spyglasses, however small, will require a stand to produce the best effect. This need not be an elaborate affair, but may be made of wood in the simplest manner, provided only that it is capable of holding the telescope steadily pointed in any required direction. Some artificial support is necessary, and, in default of anything better, the telescope might even be lashed to a round post.

"Shade glasses—For the first and last contact shade glasseswill be necessary. The most usual color for a shade is red. Either a neutral tint or green is excellent.

THE FOUR CONTACTS.

"As the moon by her motion overtakes the sun, the eclipse always begins on the west side of the solar disk (see Fig. D. First contact takes place when the advancing moon first touches the west edge of the sun, second contact is the beginning, third, the ending of totality. Fourth contact is the very end of the eclipse. The times of all four contacts should be noted.

touches the west edge of the sun, second contact is the beginning, third, the ending of totality. Fourth contact is the very end of the eclipse. The times of all four contacts should be moted.

The party to observe the contacts should be consist of two persons, one of whom should have a timepiece and writing materials and the other a telescope. With regard to the latter instrument, it may be remarked that if it is a common one—a spyglass, for instance—there will probably be no choice as to its magnifying power; but if it belongs to the better class, and has a battery of eyepieces, the power chosen should be equal to fifteen or twenty times the diameter of the objective in inches. To secure the best results the party should be entirely alone, above all, not within hearing of other observing parties. A minute or so before the expected time of contact the person with the timepiece will fix his eyes upon its second hand and begin silently to count the seconds, while the observer the telescope will carefully watch the sun. Upon the occurrence of contact the observer at will cry Mark, and the person at the timepiece will immediately write down, first, the second, then, the minute; and, finally, the hour. Before beginning to observe care must be taken to see that when the second hand points to 60, the minute hand is exactly over a minute mark; and, in observing, if the seconds are near sixty, special care will be required to avoid recording a wrong minute. Practice in calling and noting time previous to the eclipse will greatly diminish the risk of such mistakes. A little before totality a lantern should be lighted, because without it there may be difficulty in seeing the hands of the timepiece at the approach of third contact.

"Chronometer or timepiece. Observations of the internal contacts the case is different. They will be of no value urless the error of the timepiece is accurately known. The internal contacts the second should all proper persons who may apply for it at any of their offices on May 26, 28 and 29.

or contains

First The name of the station; including town, county and State

Second The date

Third A description of the location of the station with reference to the nearest prominent landmarks, as, for example, its bearing and distance from the nearest court house, rail-rand station or church; or its position with

respect to the lines of the United States land surveys; or the bearing and distance of a prom-inent mountain peak; or the bearings of three or more such mountain peaks; or, in the case of a city, the street and number, together with the names of the nearest cross streets on each side

a city, the street and number to state the names of the nearest cross streets on each side.

Fourth—A description of the timepiece, and a statement of the aperture, focal length, and magnifying power or the telescope employed.

Fifth—The times indicated by the watch at the reception of the Washington noon signal on May 26, 28 and 29.

"Slath—The time of each of the contacts, just as read from the face of the watch, without the application of any correction.
"Seventh—An estimate of the uncertainty to which these times are liable.

"Eighth—Any remarks which may be thought necessary.

necessary,
"Ninth-The signatures of the two observers
thus: A. B., observer with telescope: C. D.

Ninth—The signatures of the two observers, thus: A. B., observer with telescope. C. D., time observer.

"It is particularly requested that the original pencil memoranda of the times of contact be sent to the Naval Observatory, inclosed in the above-described report.

"If several parties observe the eclipse in the same neighborhood, it is quite likely that their recorded times may differ a little. Such differences occur even in the work of the most practised astronomers; and they must be allowed to remain. It is never permissable to after the record. A mere suspicion that such a thing has been done will insure the entire rejection of the observation.

"Limits of the Shadow Path.

LIMITS OF THE SHADOW PATH.

"There is yet much uncertainty in the best lunar tables. It is therefore important to determine accurately the true position of the path, and this may be readily accomplished by observing the duration of totality at points situated from one to ten miles within the shadow. As the duration of totality is the interval between the second and third contacts, it is determined by observing these contacts in the manner already described, except that for this purpose a knowledge of the error of the watch is unnecessary, and the observations may be is unnecessary, and the observations may be made with the naked eye if the telescope is no made with the naked eye if the telescope is not available. At places very near the edge of the shadow the totality may be so brief that the time observer would risk losing the third contact if he stopped to record the second. At such places it will be necessary to have a third person to make the record, and then both contacts can be readily observed, even if they follow each other at an interval as short as a single second.

follow each other at an interval as short as a single second.

"Since these valuable observations are so easily made it is hoped that advantage will be taken of the opportunity by many who may reside or may find themselves within the path of totality. Great care should be taken to record as accurately as possible the instant of beginning and ending of totality as described in the preceding paragraphs under the head of second and third contacts.

THE MONEY STREET HONEY STREET AND THE MONEY STREET HEAD TO SERVICE TO THE MONEY STREET HEAD THE MONEY STREET HEAD TO THE MONEY STREET HEAD THE MONEY STREET HEAD TO THE MONEY STREET HEAD THE MONEY STREET HE MONEY STREET HE

"The moon's shadow is bordered by difraction bands of alternate light and shade which are visible on any white background, and last about a minute before and after totality. At the eclipse expedition to the Caroline Islands in 1883 they were successfully observed, and the simple method adopted there is recommended. A white sheet, table spread, or other large piece of white cloth, is spread upon the ground and securely fastened, the edges lying north and south and east and west. The observer should be provided with a long rod, which he will lay upon the sheadow bands as they move rapidly across the sheat, in order THE MOON'S SHADOW BANDS

allel or perpendicular to the shadow bands as they move rapidly across the sheet, in order to get their direction. A similar one should be used for the line succeeding totality, as the directions differ widely. Measure as accurately as practicable the direction of the two positions of the rods, using a compass or other instrument in order to get their azimuth or bearing. A second observer, provided with a watch, should try to count the number of bands per minute, and estimate carefully their distance apart in inches as they move across the white surface. In the report upon this phenomenon, in giving the direction of the rods with reference to the compass points, it should be stated whether they were placed parallel or perpendicular to the lines."

parallel or perpendicular to the line: "
EDWARD S. HOLDEN.

THE TWO JEWELLERS. A Little Thing That Turned Fortune Toward

"It is curious," said Col. Calliper, "how slight thing may influence a man's whole future. In a town I lived in once, that later grew to be a thriving and prosperous city, there were two lewelers with such shops as you would expect to find in a place of a couple of thousand inhabitants; doing more business in watch and clock and jewelry repairing than they did in selling things, one doing about the same amount of business as the other, and each of them just about making a living, and maybe ust a little more. That's the way they were going along when a newcomer, a man of wealth, bought land in the town and built him a fine iouse and settled there.

"These new people had more or less tinkering to do, of course, and they tried both of the jewellers to see which they liked better, before settling on one, and it was hard for them to work and were both pleasant men. But presently something happened that made the head of the house come at once to a definite decision. a clock which the man of the newly-arrived

household used to consult in passing: he found it a good time-keeper and he came in fact to rather a friendly feeling for its owner; in fact, so far as he was concerned, as between the jewellers, he was becoming unconsicously strong partisan of a man with a clock in his window; when, going by one day, and looking in at it as usual, he saw that it had stopped: The jeweller that had placed that clock in the window, thus inviting confidence in it, and through it in himself, had forgotten to wind it.

"That settled it with the newcomer, who was a precise man, who had made his money by scrupulous and exact attention to business; and he at once threw his weight for the other and turned the scale in his favor; it was in front of his door, only, that the carriage of the newcomers was thereafter observed to stop. Their example had more or less influence, and more and more people went there, especially from among the new inhabitants. The jeweller himself to whom trade had thus come, was a shrewd man who did not fail to take advantage of his opportunities. He doubled his stock and attended to business and went in for what trade there was in the community. The town grew to be a city, and he grew with it, and got rich. The last time I was there, and this was only a few years ago, he was a prosperous merchant, with a fine big store beautifully stocked and doing a fine business. In a small store on a side street, I saw the man who had forgot to wind the clock, with a magnifying glass over his eye, bending at work over a watch on a workbench in front of him in the window.

"Occasionally, even here in this big town, I see in some watchmaker's window a clock, put there as a guide to the public and as an advertisement of the business within, that has been permitted to run down: I saw one, in fact, this morning; and that's what brought to my mind, as it always does, the story of the two iowellers."

Nerve Prevented a Glycerine Explosion. window: when, going by one day, and looking in at it as usual, he saw that it had stopped!

Nerve Prevented a Glycerine Explosion.

From the Philadelphia Record. FRANKLIN, Pa., April 29.-By one of the most cool-headed and nervy acts in the history of the Pennsylvania oil fields William Bowers of Rouseville yesterday saved the lives of a number of men and his own as well. pany and was sent to "shoot" a well for Will-

He filled a shell with thirty-eight quarts of nitro-glycerine and had the long tin tube straightened in the hole ready to lower it to the bottom of the well, when the ball at the top of the shell pulled off and the torpedo dropped. Close beside Bowers was a can containing several quarts of glycerine, and about a dozen men were in the derrick as spectators. Instantly he realized that when the shell exploded the shock would explode the glycerine in the can. He setzed the can, and with it in his arms darted rapidly from the derrick. When the shell struck the fluid, at a depth of about four hundred feet, it exploded, and a stream of oil, gas and stones rushed out of the casing with a terrific roar, tearing the top off the derrick and shattering the derrick floor.

But for the coolness and prompt action of young Bowers the can containing the glycerine would surely have been exploded, resulting in terrible loss of life. Bowers was several yards away from the derrick when the explosion came, however, and the concussion did not affect the glycerine in his arms. straightened in the hole ready to lower it to

From the Cincinnati Enquirer.

POET HURON, Mich., April 28. Otto Kresin, an employee of Frank Beckton, a saloon keeper, attends to a horse, which is kept in a barn in the rear of the Palace Rink. A month ago Kresin found a dried and chewed two-dollar Canadian bill on the floor and patched it together. It was sent to Ottawa and redeemed. On Wednesday Kresin found a ten-dollar bill and two five-dollar bills. The bills are in good condition, except that they are badly chewed The only explanation is that mice bring the money from some tiace in the neighborhood, where it may have been hidden for years. Hundreds of recopic have visited the barn, but Kreslin will not allow any one to go in, fearing that they will scare away his bonanza mice. Pieces of other bills have also been From the Cincinnati Enquirer

PROBABILITIES IN POKER. MATHEMATICAL THEORY TESTED BY

THE FACTS OF THE GAME. The Expectation of Improvement-A Hand in a Jackpot Which Science Declared to Be Most Improbable There Was One Point Where Theory and Experience Agreed.

Sam Johnson was a drummer for a silverware house and had just wound up a good day's work by selling a tidy little bill to Cohen A Straus. It was too late to go anywhere else and too early for supper; so he sat around and alked about various things for a quarter of in hour. Presently the conversation turned on anusements, and Sam remarked that he was tired of going to the theatre and did not play billiards, and did not know exactly what to do with himself. Cohen asked if he ever played toker, and Sam jumped at the suggestion of a quiet game that evening and went away with an appointment to meet his cusomers at a little uptown club about 8 o'clock.

When he arrived they were both there, but the two others who were expected to make up he party had not put in an appearance. While they were waiting the conversation naturally nened on the game, and Sam gave his customers some of his ideas on the subject, in which he rather fancied himself an expert, having studied all the books and learned all the tables of expectation of improvement by heart.

"I almost always win," he said, "because stick pretty close to the theory of probabilities I never go into a pot without tens or better, and never stay with a jack unless I have as good as openers or can draw to a bob by paying my percentage of expectation of improvement. All the money I see lost at poker is chipped away playing weak hands against

"Well," said Cohen, "I go in on anything at all if I am playing in luck, and would sooner draw to an ace and a deuce than pass a pot with four men in it.

"Me too," said Straus. "And as for jacks l always stay on a pair because my chance of making threes is as good as the opener's, and if I don't get my third man I can drop out."

According to the doctrine of probabilities, eioined Johnson, "the hand which is stronger on the go in will still be stronger after the draw in the long run and the fellow that draws to the larger pair will beat you oftener than you will beat him. That is a mathematical proposition which can easily be proved.

"But if he beats me twice out of three times he gets only my come-in money," retorted Straus. "But if I improve I not only beat him, but the whole table, and what I win when my threes stand up under me is many times what lose by paying to draw to my little pair."

"You only think that. The theory of probabilities proves that it is not so and that you must lose unless you have unusual luck. You would not agree to let one man have jacks every deal and you deuces, and you to draw

and play against him for fifty deals." "I don't play against him alone in a jackpot. I get the other fellows' money, too, al the antes and bets put up by the fellows that come in on little pairs just like mine. There is only one man with jacks or better, and if I don't improve he takes my ante. If I beat him out I get all his money and all the contributions of the others in the pot at the same tributions of the others in the pot at the same time. I don't know what the odds are against my improving and I don't care much. "They are just the same as the odds against the other fellow's improving his jacks, 3½, to 1." "Then if I lose a dollar three times in four by drawing against openers and win five or ten dollars the fourth time by improving, why don't I come out ahead?" "But the other fellow improves, too." "What are your figures for his improving at the same time you do, and for yours not being the best hand even after both have improved."

what are your nguies to his highest at the same time you do, and for yours not being the best hand even after both have improved?"
"That is something which cannot be figured out, but if he starts out ahead of you he will still be ahead of you in the majority of cases. That is mathematics, is it?" said Cohen, "Well that explains something that I never understood before and that has been a mystery to every one I ever told about it. I never took much stock in probabilities, but something happened in a little game on board the Gallia coming home from the Paris Exposition in August, 1880, which proves your theories are all right.
"There was seven of us in a ten-shilling limit game, all supposed to be fair average players like myself. One was a school principal from Albany and another was an engineer from Baltimore, both of them full of probabilities. We had played about three days and I was about

like myself. One was a school principal from Alhany and another was an engineer from Baltimore, both of them full of probabilities. We had played about three days and I was about \$30 albead, mostly saved by not calling either of those fellows unless I had threes or better. We had played about an hour and the only fellow that was watching the game had dropped off to sleep when there came along a jackpot in which I sat on the dealer's right. The school-teacher and the engineer had the first say, and both of them hesitated as if they wanted to be sure they did not have a straight. Then they passed, and all passed, up to me.

"I skinned my hand over and found a pair of aces, so I opened it for the limit. The dealer dropped. The schoolleacher came in and so did the engineer, and all the rest followed their good example. With five men drawing against me I felt pretty weak in the knees, although according to your theory. I had a cinch, as I had the best hand to start with. It was a big pot, and I thought I could see about \$25 in it for me if I could catch another ace. They drow all manner of cards from one to three and all looked pleasant, especially the schoolleacher, who took three cards. I didn't improve my aces and it was my first bet. Now, according to your probabilities, what should I do; bet the limit or chip along?"

"The probabilities are that with five men paying the limit to draw cards against openers, your aces were not worth even a chip, and I should have shown my openers and knocked on the table."

"I thought you said just now that the best hand on the start stood to win out."

"But the probabilities against improvement are only 3% to 1, and there were five men drawing, so at least two of them must have bettered."

"That's assuming they all had pairs to go with. Are there no odds against such a thing as five men having pairs and none of them open-

ers?"
"It certainly does look funny. I think the schoolteacher must have overlooked something."

"It certainly does look funny. I think the schoolteacher must have overlooked something."

"Well, I didn't overlook anything. There was seven half-crown antes and six ten-shilling raises on the table, about \$18, \$2.75 of which was mine. What are the odds against me if I put up a shilling more, just to represent and see what the others will do?"

"It is a shilling thrown away, sure. That is just how you fellows lose money. A quarter is not much, but if you do that kind of thing all the time it soon mounts up, and if you play poker for a year the probabilities are you will lose several hundred quarters by such plays."

"Well I didn't bet any quarter. I—"

"That's where you showed your good sense and saved money."

"I didn't bet any quarter, but put a good face on it and bet the limit."

"Great Scott! The idea of attempting a bluff under such circumstances. Why, the probabilities are that at least two men would call and that one would raise. You would save a lot of money if you would only study the percentages of the game. What happened, anyway?"

"Ail five men called me."

call and that one would raise. You would save a lot of money if you would only study the percentages of the game. What happened, anyway?

"All five men called me,"

"Holy smoke! Didn't I tell you! The probabilities are that there were at least two flushes and that the others had two pairs or small triplets."

"It hose are the probabilities of the case, why did not some of them raise me?"

"That's so," said Sam, scratching his head. "It was certainly remarkable that no one raised. They must have been a queer lot of poker players, especially the schoolteacher and the engineer. The others probably did not understand their refrentage of advantage and were waiting for some one else to play their hands for them by raising back again."

"Well, you will see presently that the play was all right and no one forgot anything. What I want to know is, what do your probabilities say that those five fellows should have held to stand the limit to draw cards and then to call a limit bet to see if they couldn't beat openers."

"Give it un. The only probability I can think of is that they did not understand the principle of the game or did not realize the probabilities that there must be one or two big hands out waiting for a raise. What won the pot on the show-down?"

"My pair of aces."

Sam evild not speak for astonishment for a moment, and then he laughed as if he saw the joke. "What chumps they were to call you when they could not ever heat openers."

But they could beat openers, every one of them although they could not beat my aces. The schoolteacher, who was the first to say, had passed on jacks and on the draw he had got an are and a king with them. He had flaured that if I was opening on tacks he could probably beat me with his side cards. He said something about the nathematical expectation of his hand, being the first to say had passed on jacks and on the draw he had to call me, as his percentage of the mother of the pot was in his favor, or something of that kind. The engineer second man had all o rased on jacks and ha

of kings, which he thought good enough to call on as no one was raising. Each of the other two chaps had made queens, the first one by drawing to an inside straight, queen high, which he hoped to fill with a jack, not knowing that all the jacks were held up by the schoolteacher and the engineer. The other, being the last man in, was coaxed by the size of the pot and had drawn to a king and queen of clubs. So you see that aithough there were five men calling me and all of them could beat openers, note of them could beat openers.

bilities."
That is the mot improbable hand I ever heard of." "Why, you said awhile ago that the best hand on the goal should be the best on the show-lows, and my experience proves you are dead right and now you say the thing that is a cording to the law of probabilities is the

TOLD BY THE OLD CIRCUS MAN

Restaurant Man Wins in a Brush With the Show Boss, Hands Down. "You know I've told you," said the old cir-

cus man, "about how the old man was forever playing lokes on people in the towns we came to over the great giant; making contracts in advance for one thing and unother for him. binding people to supply the things and called for at certain prices, turning up then with the giant. For instance, he would get some local shoemaker to agree to make a pair of men's shoes for so much, the man to be measured when he came to town. Of course the shoemaker never dreamed of a man the size of the giant, and when the giant appeared the shoemaker would be duly dismayed, and the whole business would be turned into an advertisement for the giant and the show; but it's only fair to say that the old man always did what was right before he got through and never let anybody lose anything by him. On the other hand, he sometimes met people that got the better of him; and from one of these, right after we got the giant, he learned a lesson so very simple that he wondered he hadn't though of it himself before.

"Going ahead of the show in a city where we were to stay a week the old man made with the proprietor of the biggest restaurant there a contract for the board of one member of his company who was very particular about his food and at the same time a large eater, this contract requiring that the boarder should be supplied with whatever he wanted that was in season, cooked to his fancy, and in any quantity that he might call for. Well, now, you know, the giant was a graceful enough eater but my gracious! the quantity required to feed him was something prodictions; and, seriously, the mere cost of his board made a substantial item in the show's expenses. But his coming to the man's restaurant didn't appear to disturb the restaurant keeper a bit; you'd have thought to see him that he'd been keeping a giant's boarding house all his life.

"He waited on the giant himself at the first meal he had there, which was dinner, served in the middle of the day. The old man was along to see that his giant got enough to eat, which he did, a great plenty. At suppertime the old man was busy and he sent me with the right conclust himself here. of his company who was very particular about

which he did, a great plenty. At supporting the old man was busy and he sent me with the giant, coming himself later. When he got to the restaurant he found a growd in the stree and this sign hanging up over the res

Nonparell Restaurant.
The Greatest of All Glants Boards Here,
Taking His Breakfast at 7 o'Clock,
His Dinner at 1,
and His Supper at 7 o'Clock.
Come in and See Him To All Our Regular Patrons No Charge for Admission.
To All Others, 25 Cents.

"And they wouldn't let the old man in till he'd paid a quarter.

"But the restaurant man turned out all right. He deducted the cost of feeding the glant and then divided those extra receipts with the old man, which was fair enough, and ever after that, in every town we struck where the giant ate at a restaurant, we used to make contracts on that basis."

PIGEON MESSAGES FROM THE SEA A Successful Experiment in Bringing Back Word From a Departing Steamship.

From the Boston Evening Transcript. For the first time on this side of the Atlantic the utility of a carrier pigeon postal service between ships at sea and the land was demonstrated this morning in Malden. Soon after suprise one of the pigeons which were liberated from the steamship La Touraine of the French Line yesterday morning when the ship was nearly twenty-four hours out from New arrived at the loft of its owner, George Hors

man, in Middlesex street, Malden. The bird is one of Mr. Horsman's best and its registered number is 428. This is its first trip over water and undoubtedly it has made the longest water trip ever accomplished by an American pigeon. To each of its legs was attached a quill sealed at both ends and con-taining a celluloid film. Each of these films is a photographic negative of twenty cards, each containing a message from some person on the ship. In addition to the messages sent from passengers there are among the cards a report of the condition of the weather, the time when the birds were released and the number sent out, and messages from the cap-

time when the birds were released and the number sent out, and messages from the captain to the manager of the line in Boston.

As soon as the quills were removed from the birds the celluloid films were extracted, but owing to the absence of an expert to work the enlarging machine the individual messages could not be immediately deciphered. They will, bowever, be enlarged this afternoon and the messages sent to their destinations by telegraph or by mail, as may have been directed on the different cards. As sufficient care was not taken by those in charge of flying the birds in nutting the messages into the quills, some of the first batch received were not in good order. As all the other birds have the same messages some of them doubtless will be perfect.

This pigeon postal service over the sea is the idea of M. Eugene Perière, President of the Compagnie Général Transatlantique. For several years he has caused experiments to be made in France under the direction of Capt. Reynard of the general staff of the French Army, who has charge of the military pigeon service of France. The experiments in that country resulted satisfactorily and a short time ago Capt. Reynard came here to experiment. It was first attempted to use New York birds, but they had to be liberated on the same day that the vessel sailed. Capt. Reynard then came to Malden and made a contract with Mr. Horeman to provide birds for each outgoing steamer. The first trial has resulted so satisfactorily that the service will be continued and each ship of the line sailing from New York will carry several pigeons. As a ship sails and arrives every week there will be a bi-weekly service from the ocean to May 5 and is due in New York on May 13. They will be liberated on the 12th and it is expected that the messages will reach their destination at least twelve hours hefore the ship reaches her dock. In this way friends of incoming passengers will be rotified in senson so that they may meet the ship in New York.

WILD ANIMALS HE KNOWS.

An Elderly Man Who Feeds the Squirrels and Birds in Prospect Park.

An old man who makes a visit to Prospect Park every fine morning during the summer spends an hour or two on the hill back of the Common feeding birds and squirrels with bread crumbs which he brings in his pockets. He is patriarchal-looking and he has managed to make a large number of friends among the birds and squirrels. A park policeman who was talking to a SUN reporter about the old man said: "I first noticed him two years ago. I saw him

going across the Common at daybreak and, wondering what he was doing in this lonely place at such an hour in the morning. I followed him. He went up the hill south of the Common and then over toward the old Indian burying ground where he sat down on the ground and began to chirp. Pretty soon I noticed that squirrels were coming toward him, and that a lot of birds were hovering around. I saw him take a lot of crumbs out of his pocket and scatter them around, and then the birds and sonirrels had a feast. This thing has been going on ever since. "When I first saw him he had only been feeding the residents of the park for a little while and hadn't become accounted with them. But my! he knows them all now and they knew him. Nowadays they come right up to him and take the crumbs from his hands. He's a queer old customer and he has no use for people around when he's communing with his friends. If anybody happens along when he is feeding the birds and squirrels he will quit at once and he wont resume until they go away. I've been in the park for iventy years and Idon't know a bird or squirrel but he knows them all. It certainly beats me how he ever got acquirinted." going across the Common at daybreak and, won-

When an advertiser has something of real value to dispose of, he first goes to THE SUN'S advertising columns with it. Rarely is he compelled to try further.—Adv.

half a y'ar, I reckon," began old Zeb White, the Tennessee possum hunter, "but as it didn't rain more'n once a week and as the leak didn't do any great hurt I wasn't breakin' my back to fix it. The old woman didn't say buthin till one mawnin' she got up with a headache and was techy. Seein' how it was, I didn't say nuthin' to provoke her, but she burned her hand agin the stove, stubbed her toe and finally busted out on me with:

"Zeb White, of all the shackelty critters on this yere Cumberland mountain nobody kin hold a candle to yo'!

What's wrong with me?' says I. "Haps and heaps of things. This old cabin is reg'larly fallin' to pieces fur the want of a day's work, but yo' ain't man 'nuff to take hold and fix things."

" 'I'll fix that leak to-morrer 'That's the old song. Yo'll go right at it this

minit or thar'll be a row. 'Look here, now,' says I, speakin' as softly as I could. I'll work all day to-morrer, but to-day I've got to go up to them limestone caves-I had a powerful vishun last night. In my vishun I saw a cave, and that cave was chuck full of coons and possums. I can't say what brung the varmints together, but thar ther

was, and thar was 500 of 'em.' 'I don't believe nuthin' of the sort!' says the old woman. 'Yo' are allus hevin' vishune bout b'ars and coons and possums, but nobody ever knowed yo' to hev a vishun 'bout choppin' wood or hoein' corn.'

"She was right bout that, but it riled me up jest the same. I answered back purty briskly, and she got mo' sassy, and so we had a row. I got up from the table and took my gun and whistled to the daws and started off, and the old woman called out to me that she hoped I'd be clawed by wildcats. I wasn't yarnin' bout that vishun. I was lyin' on my back in bed, eyes wide open, when that vishun riz up befo' me, and I seen things so clear that I fell into a tremble. That was a cave full of coons and possums, and I went in and slayed 'em by the hundreds and got 'nuff money out of their skins to buy me a mewl. I wanted to fix that leak, of co'se, but it seemed a powerful sin to let that vishun go by.

"I hadn't got more'n half a mile from the house when the dawg begun to hang back. The critter allus 'peared to take the old woman's side whenever we had a row. When I noticed him hangin' back, I yelled out at him and grabbed up a club, but he went out of sight like a rabbit. I wanted that dawg to hold the mouth of the cave while I went in and slaughtered the varmints, and I jest made up my mind to kill him when I got home. Thar was three caves, and it was a six-mile trip. The middle cave was the biggest, and when I reached it I looked all around fur tracks. Not one was to be found, but that didn't discourage me. I peered around fur a spell and then went in.
It was a narrer openin', and the cave was dark,
but I had brung along a tailer candle. I lighted
the candle and begun to look about me.
"Dod rot it, but what a fule a man kin make
of himself when be tries! Anybody of sense

The drot it, but what a fule a mankin make of himself when he tries! Anybody of sense knows that coons and possums don't go hangin' around caves. That vishun was a tarnashun lie. That cave was as big as half an acre, and I walked all over it and found nuthin'. I was mad and kickin' myself when I started to go out, but I hadn't gone fur when the roof of the cave 'peared to fall down upon me. Mebbe it was half an hour later when I opened my eyes and found myself on my back, and it seemed as if one side of my head had bin caved in. I found my rifte with the stock broken, and I could smell b'ar all around. It didn't take me long to figger out that a b'ar had followed me into the cave and fetched me a whack longside the head. In a minut I heard him sniffin' and movin' around outside the cave, and as I crawled along I found him on guard. He was lying down fair in the way, and I was his prisoner. If my rifie had been all right, I could have got rid of him in short order, but it couldn't be fired.

e fired.

"As the b'ar heard me movin' up he showed is teeth and growled in a way to make my a'r stand up. He didn't come in after me, but it was plain 'nuff that he wasn't goin' to et me out. I thought it was best to keep still fur

his teeth and growied in a way to make my ha'r stand up. He didn't come in after me, but it was plain 'nuff that he wasn't goin' to let me out. I thought it was best to keep still fur awhile and see if he wouldn't go away, and, d'yo' know, suh, to the best of my belief that critter went right to sleep. I couldn't get out without steppin' over him, and it was too risky to try that. I kept quiet for two hours, and he never moved. Then I flung a stone at him, and he woke up and growled till I had a chill.

"Mebbe yo'll say I orter hev taken comfort in that cave, but when I found the afternoon wearin' away and the b'ar hangin' on I was mighty miserable over it. The b'ars of Tennessee owed me a powerful grudge fur the way. I had slaughtered them, and who was to tell what this critter proposed to do? He could finish me off any time he wanted to, but he 'peared to be playin' another game. Bimeby it come dark, but he didn't move. I was hungry and thirsty, and I knowed the old woman would be worryin', even though she was mad. The b'ar didn't move off, however, and at last I softly crept as fur away as I could and went to sleep. I don't reckon he come nigh me durin' the night, but he might hey slipped away fur food or drink. He was thar all right when davight broke, and then I was so mad and hungry that I got desperate. With the ritle bar'l in my hards I advanced to the mouth of the cava and yelled fur him to come in and hey it out with me. He wouldn't do it. He growled and roared and clawed, but he wouldn't come in. It was a narrer place to git out, and he had all the advantage. I yelled and whooped and flung stones and called him names, but he let me tire myself out. Noon come, and he was still thar. I had another row with him, and showed his grit, but he staid outside and growled.

"I looked fur the old woman all that afternoon, but she didn't come. I had an old shotgrowled.

"I looked fur the old wornan all that afternoon, but she didn't come. I had an old shotgrowled.

"I looked fur the old wornan all that afternoon

"'Pears to me I've seen yo' befo'. Are yo'r name Zeb White?'

"That's it,' says I.
"Ginerally spoken of as the possum-hunter
of Tennessee?"

"Yes."
"Man what has vishuns of coons and pos-

"Man what has vishuns of coons and pos-sums in a cave?"

"I thought it was a vishun.'

"Yes, I know, but it was mighty sing at that when yo' was hevin' a vishun of coons and the possums yo' didn't see nuthin' of the b'ar. Zeb White, yo' come 'long home and go to work on that cabin roof and let vishuns and dreams go to pot.'

"I was glad 'nuff to do so. I tagged along behind her till we reached home, expectin' she would hev mo' to say, but she was mighty good about it. She cooked me the biggest meal I had ever eat, and she let me sleep fur twenty hours, and all she said was:

"Zeb, yere's nails and hammer and boards, and now yo' hev a vishun 'bout leaks in the roof of this cabin."

How to Make Missouri Burgoo

From the St. Louis Republic From the St. Louis Republic

For a "burgoo" of sixty gallons the fires are started at 3 o'clock in the morning, and at half past 1 o'clock in the afternoon the "burgoo" is ready to serve to the hungry Democrata. Here is a list of the ingredients of a "burgoo."

Twenty-five pounds of beef bones sawed short for the extraction of the marrow.

Forty to fifty fat half-grown chickens chopped into small pieces.

Seventy-five half-grown squirrels, especially the saddles, with the heads, which are full of brains.

Fifty squabs.
One large Gulf of Mexico turtle chopped into small pieces
Twenty-five pounds of fresh pork.
Twelve pounds of Jersey butter, browned and

Twelve pounds of Jersey butter, browned and drawn.

Fifteen pounds of old ham, chopped fine.
One bushels of Irish potatoes, sliced.
Ten bushels of scarlet tomatoes.
Four bushels of onions.
Three bushels of carrots.
The milk of 100 sweet roasting ears of cora.
Five pounds of macaroni.
All the vegetables in season in proportion.
Two hundred to 300 pods of cayenne pepper.
chopped fine.
When the "burgoo" is done it is the color of rich old burgundy. Bread has been fried and cut into dice. Every man has a gallon cup and and a big spoon. The cup is three quarters filled with "burgoo" and the dice thrown in.